



**From  
mountains**

**to the sea**

Volcanic islands  
have a continuum  
of habitats



**Formed via volcanic action,**







**Stream flow links this  
entire state's land  
mass to the coastal  
zone.**





# ***Ahupua'a* stretch from *mauka* (mountain) to *makai* (ocean)**

Land – ocean tenure based on relationships and resources

Stewardship that built a resilient society



Land and coastal zone processes are linked

Steep valleys isolate populations and lead to **new genotypes**.

Early biologists hypothesized that each valley held separate sets of species arising from **reproductive isolation**.

New species are specialized to these habitats, making them **vulnerable**.



*O'opu nopili*

Nualolo aina, Kaua'i



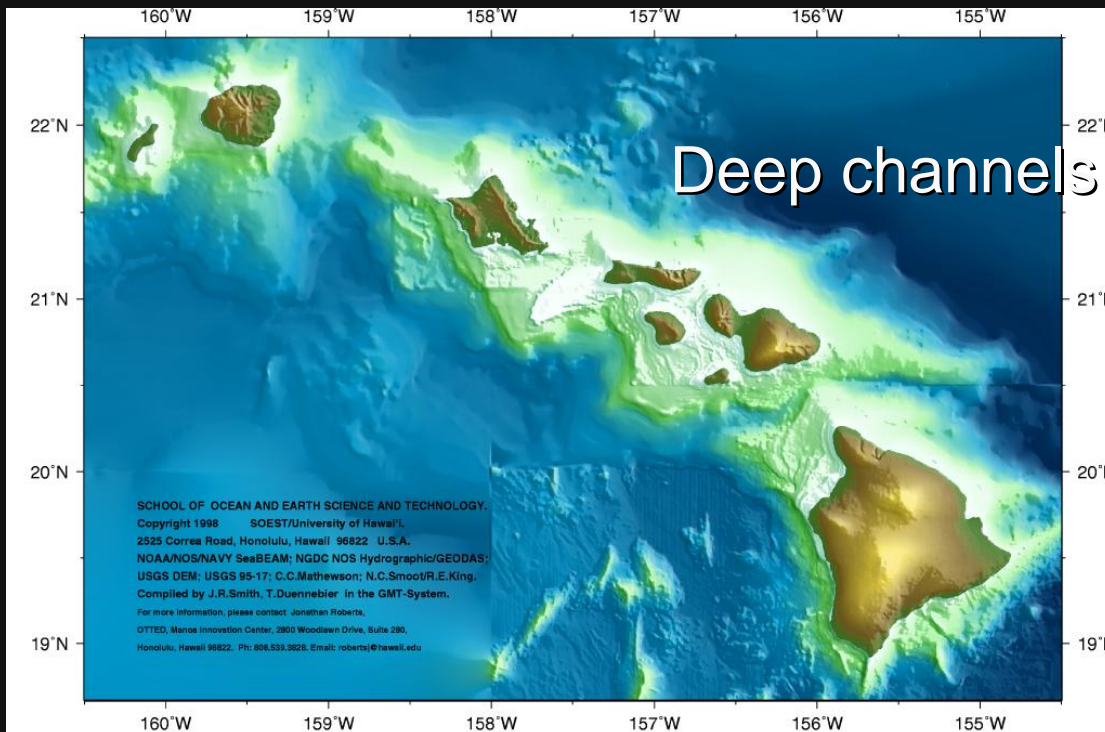


# Isolating mechanisms about

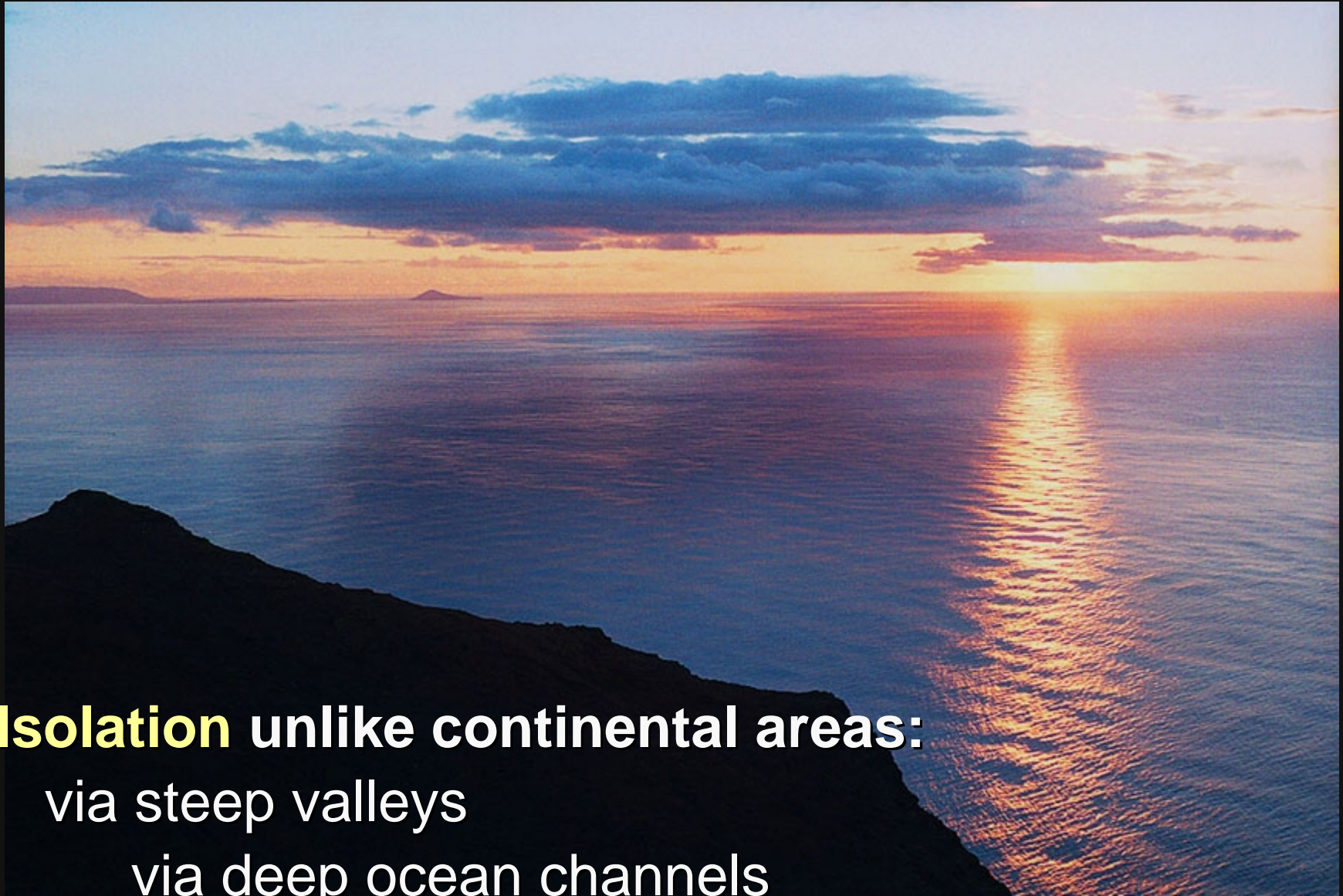
Deep valleys



Deep channels







**Isolation** unlike continental areas:

via steep valleys

via deep ocean channels

via great distances to other land masses



# Hawaii's isolation is global



Highest sea  
cliffs in the  
world



Greatest distance away from any land



# Threats to native aquatic species

Ballast water

Mechanical impacts

Non-indigenous introductions  
unintentional /intentional

Changes in land use practices

Loss of ecosystem quality –  
deterioration & poor water  
targeted species collections





Even in the ocean,  
some Hawaiian  
species are found  
no where else –  
they are **endemic**.



25 % of corals  
25 % of algae  
25 % of shallow water  
fish  
32 % of shallow  
water invertebrates  
**Only on our reefs**





**Some of our reefs  
have changed –  
dramatically**

French Frigate Shoals



Kaneohe Bay



# Natives Gallery

*Hihiwai*



*O'opu nopili*



*O'pae kala'ole*



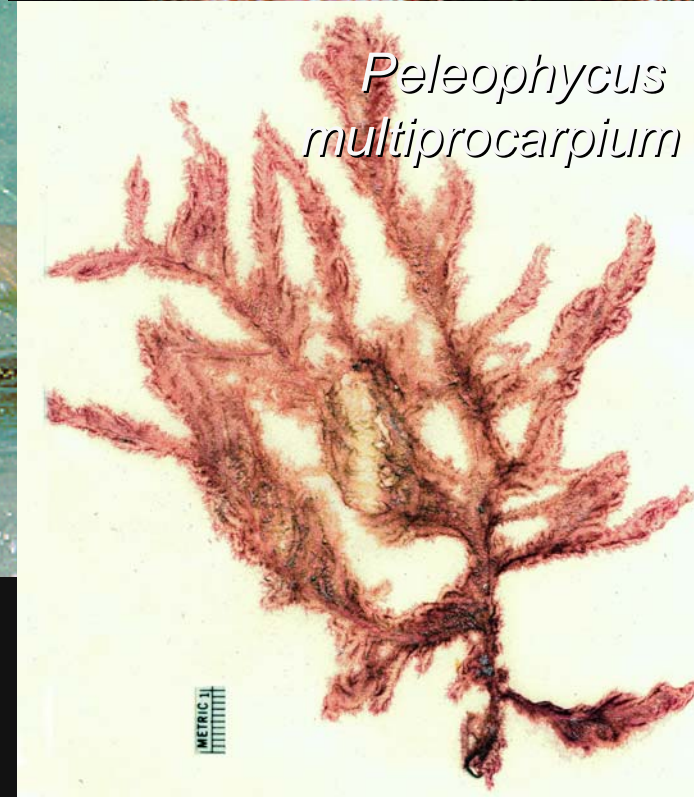
*`ilio holo i ka ua ua*



*Nohu pinao*



*Peleophycus  
multiprocarpium*



These species are only in Hawai'i



# Hawaiian Principles:

***Mālama***    To take care of; preserve

Today:

**Respect   and   conserve   the   environment**



## *Mālama i ka lani*

Stars  
guided  
their  
ancestors.





## ***Mālama i ka āina***

The land gave  
them life and  
protection.





## ***Mālama i ka wai***

Streams  
gave  
them  
water for  
their  
families  
and  
crops.





## ***Mālama i ke kai***

The ocean  
delivered  
their  
ancestors  
to these  
islands and  
gave them  
food.





***Pono*      In perfect order; true condition**

Today:  
**Do the right thing..**



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**Photo credits:**

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JE Smith: [www.botany.hawaii.edu](http://www.botany.hawaii.edu)

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